TS

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SQUIRE, SANDERS & DEMPSEY L.L.P.
14TH FLOOR
8000 TOWERS CRESCENT
TYSONS CORNER, VA 22182

EXAMINER	
CHAN, ALEX H	
ART UNIT	**PAPER NUMBER**
2633	10

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

TS

Office Action Summary	Application No.	Applicant(s)	
	09/390,910	PAN, JIN-YI	
	Examiner	Art Unit	
	Alex H Chan	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 1999*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-15,20,24-27,33 and 34* is/are allowed.

6)☒ Claim(s) *1-12,16-19,21-23 and 28-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 September 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4-5 .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 226, 262, 229, 260, 261, 263, 227 of Fig. 2 and 514 of Fig. 5. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the linear protection circuit, and a 1+1 linear protection circuit signal duplicator must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims** 1 and **32** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,570,685 B1 to Fujita et al (hereinafter Fujita) in view of 6,631,018 B1 to Milton et al (hereinafter Milton).

Regarding claim 32, Fujita discloses a bi-directional optical network (Fig. 1 and Col. 1, lines 54-58) for communicating information, comprising a pair of working optical fibers (351, 354, 355, and 358 of Fig. 1) configured in a ring (Col. 1, lines 25-29), each of the working fibers for transmitting the optical signals of the optical transmission spectrum in opposite directions; a pair of ring protection fibers (359, 362, 363 and 366 of Fig. 1) configured in a ring, each of the ring protection fibers associated with one of the working fibers for transmitting the optical signals of its corresponding working optical fiber upon a failure of its corresponding working optical fiber (Col. 11, lines 38-53); a plurality of network nodes (any node of Fig. 4) each interposed along the rings of working optical fibers and the ring protection fibers to produce a ring network topology, each of the network nodes comprising (a) a band splitter (DEMUX of Fig. 15 and Col. 13, line 55) having an input to receive a plurality of optical signals (e.g. WDM) sent on a corresponding plurality of wavelengths of the optical transmission spectrum, and to separate a first plurality of the optical signals within a first wavelength range of the optical transmission spectrum (e.g. $\lambda 1$ of Fig. 2) from a second plurality of the optical signals within a second wavelength range of the optical transmission spectrum (e.g. $\lambda 2$ of Fig. 2); (b) a cross-connect circuit (TSI of Fig. 1 or Fig. 13 or 1180 of Fig. 15 and Col. 3, lines 5-9) having input ports to receive the first and second pluralities of the optical signals and to route the first and second pluralities of the optical signals through the cross-connect circuit to targeted output ports (Col. 13, line 57-Col. 14, line 16); and (c) a band combiner (MUX of Fig. 15) coupled to

the cross-connect circuit to receive the first and second pluralities of the optical signals, and to combine the first and second pluralities of the optical signals into an aggregate plurality of optical signals for transmission from the network node (Col. 2, lines 17-23); and a ring protection circuit coupled to the band splitter to switch (e.g. via 121-n of Fig. 3) the first plurality of optical signals from the working optical fiber to an associated ring protection fiber upon recognition of the failure of its corresponding working optical fiber (Col. 11, lines 3-8).

However, he fails to disclose that such bi-directional network is in a predefined low-attenuation region of an optical transmission spectrum. Milton discloses a bi-directional optical network that has low overall loss in any wavelength (i.e. low-attenuation) (Col. 3, lines 15-16). Accordingly, one of the ordinary skilled in the art would have been motivated to predefine a low-attenuation region of an optical transmission spectrum for communicating information in a bi-directional network so that no optical amplifiers need to be employed to achieve certain ring circumference (Col. 3, lines 17-18). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the node for optical communication having a ring structure of Fujita by employing a predefined low-attenuation region of an optical transmission spectrum because Milton from the same field of endeavor teaches that this allows to prevent optical amplifiers from being needed.

5. **Claims 1-8 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,937,116 to Seto.

Regarding claims 1 and 18, Seto discloses a network node circuit (6-1 of Fig. 1) for use in wavelength division multiplexing (WDM) optical networks (Col. 1, lines 6-7) to allow utilization of a wide optical communication band (Col. 1, lines 14-17), the node circuit

comprising a band splitter (8 of Fig. 1) having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band (Col. 6, line 65-Col. 7, line 2); a cross-connect circuit (10 of Fig. 1) having input ports to receive the first and second pluralities of the optical signals and to route the first and second pluralities of the optical signals through the cross-connect circuit to targeted output ports (Col. 6, lines 48-52 and Col. 7, lines 9-14); and a band combiner (3 of Fig. 1) coupled to the cross-connect circuit to receive the first and second pluralities of the optical signals, and to combine the first and second pluralities of the optical signals into an aggregate plurality of optical signals (Col. 6, lines 52-58) for transmission from the network node. Though Seto does not explicitly teach that the band splitter separates a first plurality of the optical signals within a first wavelength range of the optical communication band from a second plurality of the optical signals within a second wavelength range of the optical communication band, he discloses it is possible to demultiplex (i.e. separates) an optical signal (e.g. WDM signal) into optical signals (e.g. first plurality and second plurality of signal in respective ranges) for respective channels (Col. 7, line 64-Col. 8, line 1 and Col. 1, lines 53-57). Accordingly, one of the ordinary skilled in the art would have been motivated to separate a first plurality of optical signal within a first wavelength range from the second plurality of optical signals in the second wavelength range because the transmission capacity of the entire system can be increased without increasing the transmission capacity for each channel by multiplexing a plurality of channels in wavelength regions (Col. 1, lines 28-32). Therefore, it would have been obvious to one of artisan in the same field of endeavor at the time the invention was made to have modified the optical transmission system of Seto to separate optical signals within a first wavelength range from second wavelength range since Seto suggests

that this allows to provide an increase in capacity of a system without an increase in transmission capacity of each channel. Also, the Examiner takes Offical Notice that separating wavelengths from a first wavelength range with a second wavelength range is well-known at the time of the invention. This rational is supported by the fact that WDM demultiplexer (i.e. band splitter) is extremely conventional in the art in which it pertains for separating different wavelengths from a WDM signal comprises a plurality of optical signals.

Regarding claims 2-3 and 8, Seto discloses that the first wavelength range corresponds to a range of wavelengths capable of being optically amplified (Col. 6, lines 62-64) and the range of wavelengths capable of being optically amplified corresponds to a range of wavelengths capable of being amplified by erbium-doped fiber amplifiers (4 of Fig.1 and Col. 6, lines 56-58).

Regarding claims 4-5, Seto discloses the second wavelength range corresponds to the wavelengths outside (i.e. different respective channels having different wavelengths (and therefore not contiguous), Col. 1, lines 45-51) of the first range of wavelengths and comprises wavelength ranges on both sides of the first wavelength range (e.g. one of ordinary could have chosen any of the wavelengths shown in Fig. 2).

Regarding claim 6, Seto discloses the wide optical communication band is in a low attenuation region (i.e. high transmittance) of an optical transmission spectrum comprising wavelengths from approximately 1240 nanometers to approximately 1610 nanometers (Fig. 2).

Regarding claim 7, Saeto discloses optical amplifiers (4 of Fig. 1) coupled to the band splitter (8 of Fig. 1) to receive and optically amplify the optical signals within the first wavelength range.

6. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of U.S. Patent No. 5,760,934 to Sutter et al (hereinafter Sutter).

Regarding claim 9, Seto fails to disclose OMS-SPRING protection fibers for the optical signals within the first wavelength range. Sutter discloses OMS-SPRING protection fibers for optical signals (Fig. 1, Col. 1, lines 48-52 and Col. 7, lines 12-18). Accordingly, one of the ordinary skilled in the art would have been motivated to employ OMS-SPRING protection fibers for the optical signals within the first wavelength range in order to have a greater transport capacity on the ring in protection against route failures (Col. 1, lines 30-31 and Col. 3, lines 2-7). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Seto to employ OMS-SPRING protection fibers for optical signals because Sutter teaches that this provides a greater transport capacity on the ring in the event of route failure.

7. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of Sutter as discussed in claim 9 above, and further in view of Fujita.

Regarding claim 10, Seto in view of Sutter fails to disclose protection switching circuitry coupled to the cross-connect circuit to collectively switch the optical signals within the first wavelength range to protection fibers, in the event of a failure of a working fiber upon which the optical signals within the first wavelength range are being transmitted. Fujita discloses protection switching circuitry coupled (e.g. via 122-1 of Fig. 3) to the cross-connect circuit (e.g. TSI of Fig. 1) to collectively switch the optical signals within the first wavelength range to protection fibers, in the event of a failure of a working fiber upon which the optical signals (Col. 3, lines 5-9) within the first wavelength range are being transmitted. Accordingly, one of the

ordinary skilled in the art would have been motivated to employ a protection switching circuit to collectively switch the optical signals within the first wavelength range to protection fibers to provide a change of communication from a protection system to optical transmission path to the working system during an ordinary working period during break of transmission path (Col. 3, lines 10-21). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Seto in view of Sutter to incorporate a protection switching circuitry because Fujita suggests that this would provide a change of communication from working to protection system in case of failure.

8. **Claims 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of U.S. Patent No. 5,793,745 to Manchester.

Regarding claims 11 and 12, Seto fails to disclose a linear protection circuit for the optical signals within the second wavelength range. Manchester discloses a linear protection (e.g. 1+1 arrangement) circuit for the optical signals (Fig. 2A-C, Col. 1, lines 56-60). Accordingly, one of the ordinary skilled in the art would have been motivated to employ a linear protection circuit for the optical signals within the second wavelength range to provide protection of the network in the event of a node malfunction or break in a link in SONET ring (Col. 1, lines 48-55). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Seto by incorporating a linear protection circuit or a 1+1 linear protection circuit because Manchester suggests that this provides protection of the network in the event of node malfunction or link breakage.

9. **Claims 16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of U.S. Patent No. 6,201,907 B1 to Farries.

Regarding claim 16, Seto fails to disclose a band splitter comprises a long period fiber Bragg grating having a Bragg resonance wavelength band substantially equal to the first wavelength range to reflect the optical signals within the first wavelength range onto a first signal path, while allowing the optical signals within the second wavelength range to pass through to a second signal path. Farries teaches a band splitter (e.g. combination of FBG λ_2 and 11 of Fig. 4a) comprises a long period fiber Bragg grating (FBG λ_2 of Fig. 4a and Col. 7, lines 59-64) having a Bragg resonance wavelength band (e.g. λ_2) substantially equal to the first wavelength range (e.g. λ_2 among input of $\lambda_1 \ldots \lambda_n$) to reflect the optical signals within the first wavelength range onto a first signal path (e.g. λ_2 reflects to port 4), while allowing the optical signals within the second wavelength range (e.g. λ_1, $\lambda_3 \ldots \lambda_n$) to pass through (Col. 7, lines 65-67) to a second signal path (e.g. port 2). Accordingly, one of the ordinary skilled in the art would have been motivated to employ a band splitter comprises a fiber Bragg grating for providing desired filtering function in transmission, reflection and dispersion (Col. 4, lines 21-27). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Seto by incorporating a band splitter comprises a long period fiber Bragg grating because Farries suggests that this allows desired filtering function in transmission, reflection and dispersion.

Regarding claim 17, Seto in view of Farries discloses all limitations as discussed in claim 16, and further discloses a band combiner (32 of Fig. 4a, Farries), wherein the reflected optical signals (e.g. λ_2' and Col. 6, lines 29-31, Farries) within the first wavelength range and the

passed optical signals within the second wavelength range (e.g. λ_1, $\lambda_3 ... \lambda_n$, Farries) are collectively combined on a common signal path to provide the aggregate plurality of optical signals (e.g. λ_1, $\lambda_2' ... \lambda_n$, Farries) for transmission from the network node.

10. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of U.S. Patent No. 6,278,536 B1 to Kai et al (hereinafter Kai).

Regarding claim 19, Seto fails to teach an optical add/drop multiplexer to selectively add additional optical signals to the first and second plurality of optical signals within the first and second wavelength ranges respectively, and to selectively drop selected ones of the first and second plurality of optical signals within the first and second wavelength ranges respectively. Kai teaches an optical add/drop multiplexer (105A and B of Fig. 18) to selectively add (i.e. insert) additional optical signals to the first and second plurality of optical signals (Col. 5, lines 12-17 and lines 37-38) within the first and second wavelength ranges (e.g. frequency signals equivalent to the wavelengths) respectively, and to selectively drop (Col. 5, lines 5-12 and lines 35-37) selected ones of the first and second plurality of optical signals within the first and second wavelength ranges respectively. Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate an optical add/drop multiplexer to selectively add and drop optical signals to provide an optical ADM that enables free branching or insertion of optical signals by selectively transmitting specified signals and receiving wavelengths different from specified ones by the nodes (Col. 1, lines 33-40). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Seto by employing an optical add/drop multiplexer because Kai suggests

that this provides an optical ADM which enables transmitting and receiving different wavelengths.

11. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,602,002 B1 to Srivastava et al (hereinafter Srivastava).

Regarding claim 21, Srivastava discloses a method for fully utilizing an optical spectrum (e.g. a spectrum of 1525-1615 nm of Fig. 7) spanning a predefined low attenuation region (e.g. wherever GAIN is high, Fig. 7) of an optical transmission spectrum, for communicating information on optical fibers of an optical network, the method comprising separating optical signals within the predefined low-attenuation region into in-band and out-band optical signals (e.g. separating 108 into S-Band, M-Band (also known as C-Band), or L-Band, Fig. 1), wherein the in-band signals substantially correspond to a first wavelength range (e.g. S-band corresponds to short wavelength, Col. 2, lines 47-48) within the predefined low-attenuation region designated for optical amplification (e.g.100 of Fig. 1), and wherein the out-band signals substantially correspond to a second wavelength range within the predefined low-attenuation region (e.g. M-Band (or conventionally known as C-band) corresponds middle wavelength, Col. 2, lines 48-49) to and exclusive of the first wavelength range (e.g. C-Band spans from 1530-1565 nm (Fig. 4A) whereas L-Band spans from 1565 to 1605 nm (Fig. 4B); routing the in-band and out-band optical signals to in-band and out-band output ports (e.g. S-Band wavelengths are routed from 150 of Fig. 1 and outputted to S-Band branch (i.e. port) for amplification whereas L-Band wavelengths are routed and outputted to L-Band branch for amplification, Col. 4, lines 52-56) for the in-band and out-band signals respectively; and combining (e.g. via 112 of Fig. 1) the in-band and out-band optical signals from the in-band and out-band output ports to provide a

united collection of the optical signals (e.g. via 166 of Fig. 1) for collective transmission. Though he does not explicitly disclose that the output ports are associated with destination nodes, he teaches that each branch (i.e. output port) (e.g. branch of $\lambda 1$ of Fig. 2) is associated with one of four routers (i.e. nodes) (WGR1-WGR4 of Fig. 2, Col. 3, lines 16-30). Accordingly, one of the ordinary skilled in the art would have been motivated to route optical signals to branches (e.g. output ports) associated with routers (e.g. destination nodes) for the purpose of providing a high-capacity optical transmission arrangement (Col. 1, lines 46-47). Therefore, it would have been obvious to one of artisan skilled in this art at the time the invention was made to modify the wide-band transmission arrangement of Srivastava by associating output ports or branches with destination nodes or routers because Srivastava teaches that this provides a high-capacity optical transmission arrangement.

12. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava in view of Fujita.

Regarding claim 22, Srivastava fails to disclose collectively switching all of the in-band signals from the optical fibers to optical protection fibers upon recognition of a failure of one or more of the optical fibers, Fujita discloses collectively switching (e.g. via 121-n of Fig, 3) all of the optical signals (λ_1 or λ_8 of Fig. 2) from the optical fibers to optical protection fibers upon recognition of a failure of one or more of the optical fibers (Col. 11, lines 3-8). Accordingly, one of the ordinary skilled in the art would have been motivated to collectively switch all of the in-band signals to optical protection fibers upon recognition of a failure of one or more of the optical fibers in order to provide a change of communication from a protection system to optical transmission path to the working system during an ordinary working period in case of break of

transmission path (Col. 3, lines 10-21). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains to have modified the wide-band transmission arrangement of Srivastava to collectively switching all in-band optical signals to protection fibers because Fujita suggests that this would provide a change of communication from working to protection fibers in case of transmission path breaks.

13. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava in view of Fujita as discussed in claim 22 above, and further in view of Sutter.

Regarding claim 23, Srivastava in view of Fujita fails to disclose collectively rerouting all of the in-band signals from the optical fibers to the optical protection fibers using OMS-SPRING protection. Sutter discloses collectively rerouting all of the optical signals from the optical fibers to the optical protection fibers (Col. 2, lines 50-54) using OMS-SPRING protection (Fig. 1, Col. 1, lines 48-52 and Col. 7, lines 12-18). Accordingly, one of the ordinary skilled in the art would have been motivated to collectively rerouting all of the in-band signals from the optical fibers to the optical protection fibers using OMS-SPRING protection in order to have a greater transport capacity on the ring in protection against route failures (Col. 1, lines 30-31 and Col. 3, lines 2-7). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to have modified the optical transmission system of Srivastava in view of Fujita to collectively rerouting all of the in-band signals from the optical fibers to the optical protection fibers using OMS-SPRING protection because Sutter teaches that this provides a greater transport capacity on the ring in the event of route failure.

14. **Claims 28-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava in view of U.S. Patent No. 6,504,638 B1 to Tanaka et al (hereinafter Tanaka).

Regarding claims 28-29, Srivastava fails to disclose reflecting the optical signals within the first wavelength range onto a first signal path; and passing the optical signals within the second wavelength range onto a second signal path. Tanaka discloses reflecting the optical signals (e.g. via FBG (Fiber Bragg Grating) 42 of Fig. 2) within the first wavelength range (e.g. S5-S8 of Fig. 2) onto a first signal path (e.g. path "d" of Fig. 2); and passing the optical signals within the second wavelength range (e.g. S1-S4 of Fig. 2) onto a second signal path (e.g. path "c" of Fig. 2 and Col. 3, lines 29-44). Accordingly, one of the ordinary skilled in the art would have been motivated to reflect signals with first wavelength range and pass signals with second wavelength range to narrow the wavelength interval and compresses the bandwidth so that a wavelength of the respective signals lights from the transmission optical fiber fits in the amplifying bandwidth of the optical amplifier (Col. 2, lines 59-67). Therefore, it would have been obvious to one of artisan skilled in this art to which it pertains at the time the invention was made to modify the wide-band transmission arrangement of Srivastava to reflect and pass wavelengths within certain wavelength range because Tanaka suggests that this allows wavelength to fit into the amplifying bandwidth of the optical amplifier.

Regarding claims 30 and 31, Srivastava in view of Tanaka discloses combining (e.g. via 46 of Fig. 2, Tanaka) the in-band (e.g. S-Band of Fig 1, Srivastava) and the out-band (e.g. L-Band of Fig 1, Srivastava) optical signals comprises reflecting (e.g. via FBG (Fiber Bragg Grating) 42 of Fig. 2, Tanaka) the in-band signals from a first signal path onto a collective signal

path (e.g. path "e" of Fig. 2, Tanaka); and passing the out-band signals from a second signal path onto the collective signal path.

Allowable Subject Matter

15. Claim 20 is allowed.

16. Claims 13-15, 24-27, 33 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ikeda et al (Fig. 6), Okazaki et al (Fig. 10 and 15), Taniguchi (Fig. 8, 20 and 30), Asahi (Fig. 1 and 9), Onaka et al (Fig. 1 and 42-43), Kuroyanagi et al (Fig. 1-3, and 17), Chang et al (Fig. 2 and 4) are cited to show multiplexing and demultiplexing and OXC in an optical ring for switching from working to protection path. Flanagan et al (Fig. 7 and Col. 6, lines 1-13) and Fishman (Col. 7, lines 1-26) are cited to demonstrate a bidirectional system having 1+1 and 1:N working-protection system for same and different wavelengths communication. Fee is cited to show yet another multiplexer and demultiplexer having cross connect (Fig. 3, 5 and 6A). Abeles et al is cited to show in-band and out-band signals being demultiplexed and multiplexed (Fig. 5). Fee et al is cited to show an optical mesh network in a working and protection system via cross connect switch (Fig. 2). Badr is cited to show a working and protection system of an optical network (Fig. 1A, 1B and 2). Chapman is cited to show a switching protection arrangement (Fig. 1).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner, Art Unit 2633
November 21st, 2003

Leslie Pascal
LESLIE PASCAL
PRIMARY EXAMINER